Curriculum Vitae of Virendra Prakash Ghate

December 2015

PERSONAL INFORMATION

Name:	Virendra Prakash Ghate
Place of Birth:	Nagpur, India.
Date of Birth:	30 July 1981
Nationality:	Indian
Office address:	Building 240, Office#7126 Environmental Science Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne IL 60439.
Contact:	E-mail: vghate@anl.gov Tel: 630-252-1609 Fax: 630-252-2959

RESEARCH INTERESTS

Boundary Layer Meteorology, Cloud Microphysics, Atmospheric Radiation.

TEACHING

11:670:431 Undergraduate Physical Meteorology, Spring 2011.

EDUCATION

2006-2009:	PhD in Meteorology RSMAS/MPO, University of Miami, FL USA Academic advisor: Dr. Bruce A. Albrecht Dissertation Title: Turbulence and mass-transports in stratocumulus clouds.
2003-2006:	M.S. in Meteorology RSMAS/MPO, University of Miami, FL USA Academic advisor: Dr. Bruce A. Albrecht Thesis Title: Characteristics of drizzle under stratocumulus using cloud Doppler radars.
1998-2002:	B.S. in Mechanical Engineering Nagpur University, Nagpur, India Thesis Title: Design and fabrication of vortex tube.

EMPLOYMENT

2014-present:	Atmospheric Scientist, Environmental Science Division, Argonne National Laboratory, IL
2013-2014:	Assistant Atmospheric Scientist, Environmental Science Division, Argonne National Laboratory, IL
2013-present:	Visiting Scientist, Department of Environmental Sciences, Rutgers University, NJ
2013-present:	Fellow, The University of Chicago Computation Institute, Chicago, IL.
2009-2013:	Research Associate, Department of Environmental Sciences, Rutgers University, NJ.
2003-2009:	Graduate Research Assistant, Division of Meteorology and Physical Oceanography, University of Miami, FL.

AWARDS AND HONORS

2007:	Mary Roche fellowship in the recognition of outstanding research at sea and scientific excellence.

PEER-REVIEWED PUBLICATIONS

Albrecht, B. A., M. Fang, and **V. P. Ghate**, 2015: Exploring stratocumulus cloud-top entrainment processes and parameterizations by using Doppler cloud radar observations. *Accepted J. Atmos. Sci.*

Ghate, V. P., M. A. Miller and P. Zhu, 2015: Similarities and differences in tropical and trade-wind cumulus topped marine boundary layers. *accepted Mon. Weather. Rev.*

Collow, A., **V. P. Ghate**, M. A. Miller and L. Trabachino, 2015: A one-year study of the diurnal cycle of meteorology, clouds, and radiation in the West African Sahel region. *Q. J. R. Meteorol. Soc.* doi: 10.1002/qj.2623

Ghate, V. P., Mark A. Miller, B. A. Albrecht and C. W. Fairall, 2015: Thermodynamic and radiative structure of stratocumulus topped boundary layers. *J. Atmos. Sci.,* **72**, 430-451

Wood, R. and co-authors, 2015: Clouds, aerosols and precipitation in marine boundary layer: An ARM mobile facility deployment. *Bull. Amer. Meteor. Soc.*, **96**, 419-440.

Fang, M., B. A. Albrecht, **V. P. Ghate** and P. Kollias: Turbulence in continental stratocumulus part I: External forcings and turbulence structures, B*ound. Layer. Meteor.* doi 10.1007/s10546-013-9873-3

Fang, M., B. A. Albrecht, **V. P. Ghate** and P. Kollias: Turbulence in continental stratocumulus part II: Eddy dissipation rates and large eddy coherent structures, *Bound. Layer. Meteor*. doi 10.1007/s10546-013-9872

Ghate, V. P., B. A. Albrecht, M. A. Miller, A. Brewer and C. W. Fairall, 2013: Turbulence and radiation in a stratocumulus topped marine boundary layer: A case-study from VOCALS REx, *J. Appl. Meteor. Climatol.,* **53**, 117-135

Miller, M. A., **V. P. Ghate** and R. Zahn, 2012: The radiation budget of West African Sahel and its controls: A perspective from observations and global climate models, *J. Climate*, **25**, 5976-5996.

Moran, K., S. Pezoa, C. W. Fairall, C. Williams, T. Ayers A. Brewer, S. P. deSzoeke and **V. Ghate**, 2011: A motion-stabilized w-band radar for shipboard observations of marine boundary-layer clouds. *Bound. Layer. Meteor.*, doi:10.1007/s10546-011-9674-5

Zheng, X., B. Albrecht, H. H. Jonsson, D. Khelif, G. Feingold, P. Minnis, K. Ayers, P. Chuang, S. Donaher, D. Rossiter, **V. P. Ghate**, J. Ruiz-Plancarte, and S. Sun-Mack, 2011: Observations of the boundary layer, cloud, and aerosol variability in the southeast Pacific coastal marine stratocumulus during VOCALS-REx, *Atmos. Chem. Phys.*, **11**, 9943-9959, doi:10.5194/acp-11-9943-2011.

Ghate, V. P., M. A. Miller and L. DiPretore, 2011: Vertical velocity structure of marine boundary layer trade wind cumulus clouds. *J. Geophys. Res.* **115**, D23201, doi:10.1029/2010JD014400.

Zhu, P., B. A. Albrecht, **V. P. Ghate** and Z. Zhu, 2010: Multiple scale simulations of stratocumulus clouds. *J. Geophys. Res.*, **115**, D23201, doi:10.1029/2010JD014400

Ghate, V. P., B. A. Albrecht and P. Kollias, 2010: Turbulence structure of non-precipitating continental stratocumulus clouds. *J. Geophys. Res*., **115**, D13204, doi:10.1029/2009JD013091.

Ghate, V. P., B. A. Albrecht, C. W. Fairall and R. Weller, 2009: Climatology of surface meteorology, surface fluxes, cloud fraction and radiative forcing over South-East Pacific from buoy observations. *J. Climate*, **22**, 5527–5540.

Rauber, R. M. and co-authors, 2007: In the driver's seat: RICO and education. *Bull. Amer. Meteo. Soc.*, **88**, 1929-1937.

Ghate, V. P., B. A. Albrecht, P. Kollias, H. H. Jonsson and D. W. Breed, 2007: Cloud seeding as a technique for studying aerosol-cloud interactions in marine Stratocumulus., *Geophys. Res. Lett*., **34**, L14807, doi:10.1029/2007GL029748.

PUBLICATIONS IN PREPARATION

Ghate, V. P., M. P. Jensen and T. Toto: Diurnal cycle of mass transports in cumulus topped boundary layer: A case-study from ARM Darwin site.

PRESENTATIONS AND INVITED TALKS

Albrecht, B. A., P. Zuidema, C. S. Bretherton, R. Wood, and **V. P. Ghate**, 2015: Cloud System Evolution in the Trades – CSET. *AGU Fall Meeting.*

Ghate, V. P., M. A. Miller and P. Zhu, 2015: Similarities and differences in tropical and trade-wind cumulus topped marine boundary layers. ARM/ASR Joint user facility PI meeting. Vienna, VA.

Ghate, V. P, M. P. Jensen and T. Toto, 2014: Transport of mass and water vapor in cumulus topped boundary layers: A case-study from ARM Darwin facility. *AGU Fall Meeting.*

Ghate, V. P., M. P. Jensen, 2014: Transport of mass and water vapor in cumulus topped boundary layers: A case-study from ARM Darwin facility. *ASR working group meeting.*

Ghate, V. P., M. A. Miller and B. A. Albrecht, 2014: On the dynamics and radiation of cumulus topped marine boundary layers. *Warm Low Cloud Thematic Group Breakout Session. ASR PI meeting 2014.*

Collis, S., S. Giangrande, K. North, **V. P. Ghate**, J. Helmus, A. Theisen, 2014: Prove It! ARM's progress towards a suite of verified precipitating cloud system retrievals. *ASR PI Meeting 2014*

Collis, S., J. Helmus, J. Leinonen, S. Giangrande, **V. P. Ghate**, C. Sivaraman, K. Gaustad, N. Bharadwaj, J. Monroe and B. Ermold, 2014: Data fusion in remote sensing in the ARM program using Python, *Fourth Symposium on Advances in Modeling and Analysis Using Python, American Meteorological Society Annual Meeting*, Atlanta, Ga.

Ghate, V. P., 2013: Thermodynamics and radiation in stratocumulus topped boundary layers, *Department of Atmospheric and Oceanic Sciences*, McGill University, Montreal Canada.

Ghate V. P., S. G. Decker and Mark Miller, 2013: Velocity scaling in stratocumulus topped boundary layer, 4th *ASR Science team meeting*, Potomac, MD

Ghate, V. P. and J. Comstock, 2013: Past year activities of the ASR vertical velocity focus group. *4th ASR Science team meeting*, Potomac, MD

Ghate, V. P., 2013: Dynamics, thermodynamics and radiation in a stratocumulus topped boundary layer. *Invited talk* Argonne National Lab, Argonne IL.

Ghate, V. P., R. Coulter, J. Helmus and T. Martin, 2014: Updates on ARM RWP work at ANL. *ARM Radar Science Meeting, Miami FL*

Decker, S. G., **V. P. Ghate** and M. A. Miller, 2013: Large Eddy Simulations over Cape Cod in support of the ARM Two-Column Aerosol Project. *11th symposium on the coastal environment.*

M. A. Miller and **V. P. Ghate**: Unraveling the life-cycle of low clouds. 2012 ASR Fall working group meeting. Rockville, MD

Zhu, P. and **V. P. Ghate**, 2012: Evaluation of parameterizations of the vertical fluxes induced by boundary-layer clouds using ARM observations and high resolution simulations. *3rd ASR Science Team Meeting*, Arlington, VA

Fang, M., B. A. Albrecht, **V. P. Ghate** and P. Kollias, 2011: A case study on turbulence in continental stratocumulus clouds. Annual ASR working group meeting, Annapolis, MD.

Ghate, V. P. and M. A. Miller 2011: Regimes of boundary-layer structure in the Azores using data from the ARM mobile facility. Extended abstracts, *2nd annual ASR science team meeting*, San Antonio TX.

Fang, M., B. A. Albrecht, P. Kollias and **V. P. Ghate**, 2011: Turbulence estimates in continental Stratocumulus using ARM cloud radar observations. *35th Conference on Radar Meteorology.*

Fairall, C. W., K. Moran, S. Pezoa, D.E. Wolfe, S. de Szoeke and **V. P. Ghate**, 2010: A new motion-stabilized W-band (94-GHz) cloud radar for observations of marine boundary-layer clouds. *15th International Symposium for the advancement of boundary layer remote sensing*. Paris, France.

Fairall, C. W., S. P. de Szoeke, A. Brewer, P. Zuidema and **V. P. Ghate**, 2010: Retrieval of cloud microphysical and turbulence profiles using the NOAA/PSD W-band cloud radar from R/V Ronald H. Brown during the VOCALS-REx field program. *19th Symposium on Boundary Layers and Turbulence*.

Ghate, V. P., B A. Albrecht and P. Kollias, 2008: Turbulence structure of continental boundary layer clouds. 2008 Annual ARM Science Team Meeting, Norfolk, Virginia

Ghate, V. P., B. Albrecht, P. Kollias, H. Jonsson and D. Breed, 2006: Cloud seeding as a technique for studying aerosol-cloud interactions in marine stratocumulus. 2006 Annual ARM science team meeting, Annapolis Maryland

STUDENT ADVISING AS PRIMARY ADVISOR

Jacob Carlin, Rutgers University undergraduate honors thesis, 09/2011 – 05/2012

STUDENT ADVISING AS COMMITTEE MEMBER

Allison Collow, Rutgers University [PhD Dissertation Committee], 12/2013-present
Matthew Niznik, Rutgers University [Oral Comprehensive Exam Committee], 06/2012
Ross Alter, Rutgers University [Oral Comprehensive Exam Committee], 06/2011

CONFERENCE ABSTRACTS

Nguyen, T. K., **V. P. Ghate**, and A. M. Carlton, 2015: Seasonal differences in aerosol water pay reconcile AOT and surface mass measurements in the Southeast US. *AGU Fall Meeting.*

Ghate, V. P., B. A. Albrecht, H. H. Jonsson, and I. PopStefanija, 2015: On the use of radar echo from Chaff to study entrainment in Stratocumulus topped marine boundary layers. *AGU Fall Meeting.*

Mohrmann, J., B. A. Albrecht, C. S. Bretherton, **V. P. Ghate**, P. Zuidema, and R. Wood, 2015: A novel approach to Lagrangian sampling of marine boundary layer cloud aerosol in the northeast Pacific: case studies from CSET. *AGU Fall Meeting.*

Schwartz, M. C., **V. P. Ghate**, J. Vivekanandan, P. Tsai, and S. Ellis, 2015: Retrievals of vertical air motion from the HIAPER cloud radar during CSET. *AGU Fall Meeting.*

Schwartz, M. C., and **V. P. Ghate, 2015**: Transition from Stratocumulus to Cumulus cloud regime: A case-study from MAGIC field campaign. *ARM/ASR Joint user facility PI meeting.*

Ghate, V. P., R. Coulter and P. Kollias, 2015: Climatology of boundary layer depth at the ARM SGP central facility. *ARM/ASR Joint user facility PI meeting.*

Ghate, V. P., M. A. Miller and B. A. Albrecht, 2014: On the dynamics and radiation of cumulus topped marine boundary layers. *2014 ASR PI meeting.*

Troyan, D., K. Johnson, M. Jensen, P. Kollias and **V. P. Ghate**, 2014: WACR-ARSCL: Current status and future plans. *2014 ASR PI meeting*

Miller, M. A., B. Raney, **V. P. Ghate** and S. Decker, 2014: A large eddy simulation of cloud radar observations. *2014 ASR PI meeting.*

Zheng, X., B. A. Albrecht and **V. P. Ghate**, 2014: A numerical study on factors controlling the cumulus cloudiness variations at the ARM TWP Nauru site. *2014 ASR PI meeting.*

Decker, S. D.**, V. P. Ghate** and M. A. Miller, 2014: The mesoscale structure of drizzling stratocumulus clouds: Perspective from observations and large eddy simulations, *2014 Annual AMS meeting*, Atlanta Georgia.

Ghate, V. P. and M. A. Miller, 2013**:** Effects of clouds on cross-atmospheric radiative flux divergence: case studies in different cloud conditions. *AGU Fall Meeting*, San Francisco, CA.

Ghate, V. P., Mark A. Miller and B. A. Albrecht, 2013: Thermodynamic and radiative structure of cumulus topped marine boundary layers, *4th ASR science team meeting*, Potomac MD.

Newsom, R., **V. P. Ghate**, P. Kollias, L. Berg and J. Comstock, 2013: The Doppler lidar boundary-layer turbulence statistics value-added product, *4th ASR science team meeting, Potomac MD.*

Miller, M.**, V. P. Ghate**, S. G. Decker and B. Raney, 2013**:** Forward modeling of radar observables using a large eddy simulation model: A new approach to optimization of cloud radar scan strategies. *4th ASR science team meeting*, Potomac MD.

Ghate, V. P., M. A. Miller and B. A. Albrecht, 2012: Thermodynamic and radiative structure of stratocumulus topped boundary layer. *3rd ASR Science Team Meeting, Arlington, VA*

DiPretore, L., M. A. Miller and **V. P. Ghate**, 2012: Observation and model comparison of the thermodynamic environment using the microwave radiometer profiler. *3rd ASR Science Team Meeting*, Arlington, VA

Wyant, M and co-authors, 2012: Science highlights from the CAP-MBL field campaign at Graciosa Island. *3rd ASR Science Team Meeting*, Arlington, VA

Albrecht, B. A., **V. P. Ghate** and P. Kollias, 2012: What controls the fractional cloudiness of fair-weather cumuli in a tropical marine environment? *3rd ASR Science Team Meeting*, Arlington, VA

Marquardt, A., M. A. Miller and **V. P. Ghate**, 2012: A one-year study of the diurnal cycle of clouds and radiation in the West African Sahel region. *3rd ASR Science Team Meeting*, Arlington, VA

Miller, M. A., **V. P. Ghate**, L. DiPretore and R. Zahn, 2011: The radiation budget of the West African Sahel and its controls: A perspective from observations and global climate models. *Annual ASR working group meeting,* Annapolis, MD.

Ghate, V. P., M. A. Miller and B. A. Albrecht, 2011: Thermodynamic structure of stratocumulus topped boundary layer. *Annual ASR working group meeting*, Annapolis, MD.

Fang, M., B. A. Albrecht and **V. P. Ghate**, 2011: Turbulence Estimates in Continental Stratocumulus Using ARM Cloud Radar Data. Extended abstracts, *2nd annual ASR science team meeting*, San Antonio, TX.

Albrecht, B. A, P. Kollias and **V. P. Ghate**, 2011: Controls on cloud base mass flux and cloudiness of fair-weather cumuli in a marine environment. *Extended abstracts, 2nd annual ASR science team meeting*, San Antonio, TX.

Miller, M. A., R. Zahn and **V. P. Ghate**, 2011: Pico and Graciosa cloud optical thickness experiment. *Extended abstracts, 2nd annual ASR science team meeting*, San Antonio, TX.

Ghate, V. P., B. A. Albrecht, M. A. Miller, C. W. Fairall and A. Brewer, 2010: A case-study on stratocumulus topped marine boundary layer observed during VOCALS-Rex. *Fall meeting, AGU*, San Francisco, Cali, 13-17 Dec

Albrecht, B. A., **V. P. Ghate** and P. Kollias, 2010: Factors controlling boundary layer cloud fraction and mass flux at the ARM Nauru Site. *Extended abstracts, ARM-CONF-2010*, Washington DC

Miller, M. A., **V. P. Ghate** and R. Zahn, 2010: Global climate model performance in west Africa: realizing the goals of RADAGAST. *Extended abstracts, ARM-CONF-2010*, Washington DC

Ghate, V. P., and M. A. Miller, 2010: Morphology and dynamics of non-precipitating marine fair weather cumulus clouds. *Extended abstracts, ARM-CONF-2010, Washington* DC.

Ghate, V. P., B. A. Albrecht and P. Kollias, 2009: Diurnal variations in turbulence and mass-transports in continental boundary layer stratocumulus clouds from millimeter wavelength radar observations. Extended abstracts, *34th Conf. on Radar Meteorology*, Williamsburg, VA

Ghate, V. P., B. A. Albrecht and P. Kollias, 2008: Turbulence structure of continental stratocumulus clouds. Extended abstracts, *15th Internat. conf. on cloud and precip. (ICCP)*, Cancun, Mexico.

Albrecht, B. A, P. Kollias and **V. P. Ghate**, 2007: Observations and parameterization of boundary layer structures and clouds at ARM TWP Nauru site, *ARM-CONF-2007*, Monterey California.

Ghate, V. P., B. A. Albrecht, C. W. Fairall, R. A. Weller, 2007: Climatology of marine stratocumulus cloud fraction in south-east pacific using surface longwave radiative flux observations. Eos Trans. AGU, 88(23), *Jt. Assem. Suppl*., Abstract A23B-07

Ghate, V. P., B. Albrecht, P. Kollias, H. Jonsson and D. Breed 2006: A new Technique for Studying Aerosol-Cloud Interactions in Marine Stratocumulus., *Eos Trans. AGU, 87*(52), Fall Meet. Suppl., Abstract A33B-1005

Ghate, V. P., I. Jo, E. Serpetzoglou, B. A. Albrecht, P. Kollias and J. B. Mead, 2005: High resolution observations of drizzle from stratocumulus using a 95 GHz FMCW radar. Extended abstracts, *32nd Conf. on Radar Meteorology*, Albuquerque, NM, Amer. Meteor. Soc., CD-ROM, P1R.1.

FIELD EXPERIMENT PARTICIPATION

Cloud System Evolution in the Trades (CSET) 2015

- Research flights planned for the summer 2015 using the NCAR's High Performance Instrumented Airborne Platform for Environmental Research (HIAPER) to study transition of stratocumulus to cumulus clouds in the North Pacific.

Stratocumulus Entrainment and Precipitation Studies (SEPS) 2014

- An aircraft field campaign to study the effects of entrainment and precipitation on marine stratocumulus clouds. I was part of the team responsible for planning and conducting the flights as well as the team for analyzing collected data.

Southeast Asia Composition, Cloud, Climate Coupling Regional Study (SEAC^{4}RS) 2012

- Research cruise conducted off of the coast of Philippines to characterize the aerosol and cloud structure in the region. Responsible for operating cloud radar and lidar.

Key West Aerosol Cloud Experiment (KWACEX) 2012

- Flight experiment conducted to study aerosol-cloud interaction pertaining to tropical cumulus clouds. Part of a group conducting routine research flights to observe the tropical cumuli.

Cloud and Precipitation Study (CPS) 2008

- Field campaign to study the cloud and precipitation structure associated with tropical cyclones. Part of the group operating two Doppler cloud radars.

VAMOS Ocean-Cloud-Atmosphere-Land Study Regional Experiment (VOCALS Rex) 2008

- Multi-institution field campaign conducted to study marine stratocumulus clouds. Part of the science team conducting routine research flights to observe cloud and boundary layer structure over the South-East Pacific region.

Monterey 2006

- Flight experiment conducted to do cloud seeding experiment in the stratocumulus cloud deck observed in the North-East Pacific. Part of a team to conduct routine research flights.

Stratus 2005 and Stratus 2006;

- Research cruises conducted to overhaul buoy and observe stratocumulus clouds in the South-East Pacific. Responsible for operating cloud radars.

Rain In Cumulus over Ocean (RICO) 2005

- Multi-institution field campaign conducted to study trade wind cumulus clouds over the tropical Atlantic. Part of the scientific crew onboard R/V Seaward Johnson operating cloud radars.

Tropical Atmosphere Ocean (TAO) 2004

- Research cruise conducted to overhaul buoys and to observe clouds over tropical East Pacific. Part of a team operating the meteorological instrumentation onboard R/V Ronald H. Brown.

SERVICE

Participant in the first ever ARM summer training and science application event on observations and modeling of aerosols, clouds, and precipitation. National Weather Service, Norman, OK. 07/15-07/24, 2015.

Session Co-Convener (with M. Jensen and P. Kollias), Convective Cloud Processes, AGU Joint assembly, Montreal 2015.

Co-lead (with J. Comstock, PNNL) of the Vertical Velocity Focus Group (VVFG) within the Atmospheric System Research (ASR) program. 2012 – Present

Session Co-Convener (with J. Mather and J. Comstock)**,** Observing and modeling atmospheric vertical motion, American Geophysical Union Fall Meeting, 2013

Member, Department of Environmental Sciences graduate admissions committee, 2012 – 2014

Designed and conducted a 5 day workshop aimed to give an overview of instrumentation at the ARM Mobile Facility and the possible usage of the collected data at the Aryabhatta Research Institute of Observational Sciences (AIRES), Nainital India, 11/2011

PUBLICATION REVIEW SERVICE

Journal of Atmospheric Sciences
Journal of Atmospheric and Oceanic Technology
Journal of Applied Meteorology and Climatology
Journal of Climate
Monthly Weather Review
Bulletin of American Meteorological Society
Geophysical Research Letters
Journal of Geophysical Research
Reviews of Geophysics
Atmospheric Chemistry and Physics
Atmospheric Measurement Techniques
Journal of Atmospheric Research
Boundary Layer Meteorology

GRANT REVIEW SERVICE

National Science Foundation Physical Meteorology Program
National Science Foundation Atmospheric Chemistry Program
Department of Energy – Atmospheric System Research Program
Department of Energy – Wind Technology Program

PROFESSIONAL AFFILIATIONS

American Meteorological Society (AMS)
American Geophysical Union (AGU)
Department of Energy (DOE)'s Atmospheric Radiation Measurement (ARM) program
DOE Atmospheric System Research (ASR) Program